Bilateral testicular abscess due to *Streptococcus pneumoniae*

Pneumonia, meningitis, and bacteremia are the most frequent invasive diseases caused by *Streptococcus pneumoniae*. Unusual manifestations of invasive pneumococcal infections have rarely been reported. Examples of these infections include pancreatic and liver abscesses, aortitis, gingival lesions, phlegmonous gastritis, inguinal adenitis, tubo-ovarian abscesses, and necrotizing fasciitis.[1] We report herein a case of bilateral testicular abscess due to *S. pneumoniae* in a patient with lung cancer. To our knowledge, this is the third case reported in the literature.

An 81-year-old male patient with epidermoid carcinoma of the lung treated with palliative radiotherapy, was admitted to the University Hospital of Guadalajara (Spain) with a 10-day history of left testicular pain, fever, and chills. There was no history of respiratory symptoms. The patient had been treated with oral ciprofloxacin (500 mg every 12 h) for a few days before admission. On admission, the patient did not appear toxic. Physical findings included body temperature 36 °C, pulse rate 97/min, and blood pressure 110/74 mmHg. The left testis was found to be painful, red and tender, and enlarged with fluctuation. No urethral discharge was present. The remainder of the physical examination was unremarkable. Blood parameters revealed the following values: hemoglobin 10.8 g/dl, hematocrit 33.3%, white blood cells 11.91×10^9/l (neutrophils 81.5%, lymphocytes 7.6%, monocytes 7.4%), and platelets 661×10^9/l; prothrombin and partial thromboplastin times, serum electrolytes, and creatinine levels were within normal limits.

The left scrotum was excised, the abscess was drained, and a Penrose drain was placed. Therapy with analgesics and oral ciprofloxacin (750 mg every 12 h) was initiated. One day later, the Penrose drain was removed and the wound was washed with physiological saline containing povidone iodine every day. The culture of pus obtained from the abscess yielded *S. pneumoniae*. Identification of the strain was done by conventional biochemical tests and the Vitek GP card (bioMérieux, Marcy l'Etoile, France). An antibiotic susceptibility study was done by microdilution using the P533 susceptibility card by Vitek (bioMérieux, Marcy l'Etoile, France). The strain was sensitive to penicillin (minimum inhibitory concentration (MIC) $\leq$0.06 μg/ml), cefotaxime ($\leq$0.06 μg/ml), ciprofloxacin ($\leq$1 μg/ml), vancomycin ($\leq$1 μg/ml), trimethoprim/sulfamethoxazole ($\leq$10 μg/ml), and rifampin ($\leq$0.25 μg/ml), and resistant to erythromycin ($\geq$1 μg/ml). Blood samples were not taken for culture. Urine culture was negative.

The patient's condition improved but three days after admission, the right testis appeared painful, red, and enlarged with fluctuation. Ultrasound examination showed a marked enlarged right testis with heterogeneous content in both testes (Figure 1). The right abscess was drained and culture of pus yielded *S. pneumoniae* with an identical susceptibility pattern. On the fourth hospital day, intravenous amoxicillin–clavulanate (1 g every 12 h) was added to ciprofloxacin. The patient's condition gradually improved. On day 10, therapy with ciprofloxacin was discontinued and the patient was discharged from hospital with resolution of the testicular infection. He was treated with oral amoxicillin–clavulanate (500 mg every 8 h) during the following 6 days. He had no recurrence of his symptoms during a follow-up for 1 year.

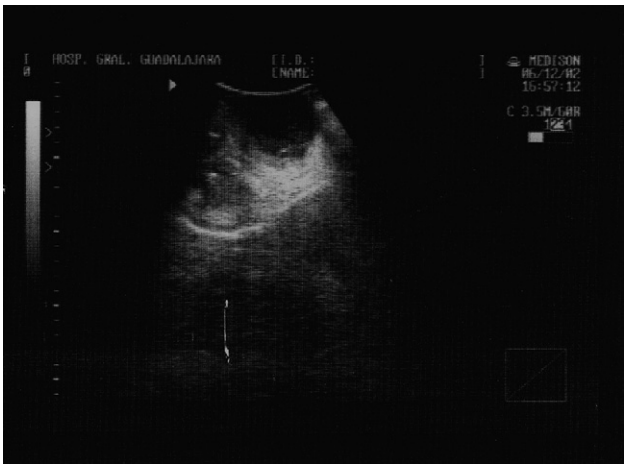

Figure 1 Testicular ultrasound showing heterogeneous content in both testes.

Testicular abscess is an uncommon disease and it is usually a complication of advanced or untreated epididymo-orchitis. The most frequently isolated bacteria are Gram-negative bacilli, especially *Escherichia coli*.[2] Occasionally cases due to *Salmonella* typhi, *Streptococcus agalactiae*, *Brucella spp*, *Clostridium perfringens*, *Veillonella parvula*, and *Bacteroides spp* have been reported.[3–7] In some cases the infection can be polymicrobial.[6,7] To our knowledge, only two cases due to *S. pneumoniae* have previously been reported in the literature.[8,9] Dobroszycki et al. described a testicular abscess in an HIV-infected infant who was diagnosed with bacteremia due to this organism.[8] Recently, another case has been reported in a patient with common variable immunodeficiency.[9] Our patient was also an immunocompromised host. Initially, he was diagnosed as having left testicular abscess, but 3 days after admission a new abscess was diagnosed in the right testis. Bilateral presentation of testicular abscess is very unusual and few cases have been reported in the literature.[7]

Testicular abscess occurs through hematogenous spread of organisms or by reflux through the urinary tract system.[5,8] Occasionally, the infection has been reported following laparoscopic appendectomy.[10] In our patient, the source of infection was unknown. Unfortunately, blood samples were not taken for culture. It is possible that the source may have been related to hematogenous spread from the respiratory tract. There was no history of respiratory symptoms, but lung cancer patients have a high rate of bronchial colonization, mainly with potentially pathogenic organisms such as *S. pneumoniae*.[11] Diseases such as non-hematologic malignancies, alcoholism, cirrhosis, and diabetes mellitus appear to confer a two- to five-fold increased risk of pneumococcal bacteremia in case–control series.[12] The lack of blood culture does not dismiss the possibility of an epididymo-orchitis as part of a systemic infection caused by *S. pneumoniae* with the testicular abscess as a local complication.

Clinical symptoms and physical examination are often not enough for definite diagnosis due to pain and swelling that limit an accurate palpation of the scrotal contents. Ultrasonography is very useful in elucidating the nature of an indurated scrotal mass and also in detecting the presence of a testicular abscess.[13]

In our patient, a feature of interest was the development of a new abscess in the right testis after 3 days of treatment with ciprofloxacin, to which the microorganism was sensitive in vitro. In addition, the patient had been treated with ciprofloxacin for a few days before admission. Possible explanations for this include the inability of ciprofloxacin to penetrate the testis or an inadequate duration of therapy. Although ciprofloxacin penetrates well into prostatic fluid and ejaculate,[14] no information on testicular concentrations is available. A similar finding was reported by Huth and Goldstein.[3] They described a recurrent testicular abscess caused by *Salmonella* typhi sensitive to ciprofloxacin that was treated with this antibiotic for two weeks, and suggested that prolonged antibiotic therapy may be required to cure these infections. The testis is a known pharmacologic sanctuary and it would account for the lack of antibiotic success. Although ciprofloxacin is not the best choice for the empirical treatment of testicular abscesses, initially we used this antibiotic because this infection is rare and our experience is limited. Our patient's condition improved after surgical drainage and after the addition of amoxicillin–clavulanate to ciprofloxacin. These observations support the findings of difficulties in curing these infections by antibiotic therapy alone and the role of surgery in treatment. Similar findings have been recently reported.[9] In contrast, however, the case reported by Dobroszycki et al. was successfully cured without surgical treatment, after completion of a 14-day course of antibiotic therapy with intravenous penicillin.[8]

In conclusion, *S. pneumoniae* should be considered as a cause of testicular abscess, especially in immunocompromised patients. A combination of surgical drainage and systemic antibiotic therapy can be necessary for the management of this infection.

Conflict of interest: No conflict of interest to declare.

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